ADDING ORANGES AND HORSES: A CAUTIONARY TALE FOR BOTH TEACHERS AND STUDENTS

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There is no student comment more frequent in Japan than the remark that students (" we," " I ") know how to read and write, but they (" we," " I ") don't know how to speak—at least " not very well." Whenever I encounter this comment, I am reminded of another conversation with a student, this one unique. Faced with a passage of English, he examined it studiously for several minutes. Finally he announced, " I can read it—but I don't know what it means."

This remarkable announcement must naturally lead to speculation as to just what the young man intended by " read." He seems to have intended being able to pronounce it, to read the passage aloud—no doubt " after a fashion," " in a way." Surely, though, truly being able to read signifies also being able to understand what meaning is being conveyed. If, then, the young man was not able to " know what it means," he could not truly be said to have been able " to read " it.

Indeed, as I correct many student papers I am often led to wonder what on earth the student could have been thinking of to have answered like *that*. How, that is, could the student have read the passage so as to extract that meaning? Perhaps an extended examination and analysis of one particular set of student answers may throw some light onto common pitfalls in the path of learning. The teacher (and the prospective teacher) can, that is, perhaps glean some hints as to effective teaching techniques by examining the patterns into which student errors tend to fall.

On December 3, 1984, the English Department of Tokyo Joshi Dai-

gaku administered a written examination to 168 first-year students who wished to major in English. This examination was necessitated by the fact that more first-year students wished to major in English than the English Department could accommodate. Since 150 of those 168 applicants were eventually accepted as English majors, this group of students may be taken as more or less representative of Tokyo Joshi Daigaku students of English in their first and second years. By the same token, of course, they can be regarded as undoubtedly better than the average Japanese student in their English ability—an ability which, as I have remarked, is based, by seemingly common consent, on their ability to read more or less well.

First of all, let me present the complete examination.

EXAMINATION TO DETERMINE ENGLISH MAJORS—December 3, 1984

First read the following passage. Then answer the questions based on it.

Before the late eighteenth century, people had no reason to care what time it was in towns other than their own. There was then no instantaneous contact among communities, since the telegraph and telephone had yet to be invented. Nor were there any regular transportation services; (1)*timetables were virtually unheard of.*

The British mail-coach service, introduced during the 1780s, did operate according to a schedule and, thus, highlighted the problems posed by the multitude of local times. To minimize confusion, the post office established the precursor of a regional time zone. Since the Royal Observatory, in Greenwich, was the most reliable timekeeper in Britain, every mail-coach guard was required to carry a timepiece set to Greenwich mean time. But this new standard was not taken up by the populace. In those days the post office served mainly the affluent, so most citizens still lived their lives (2)*without giving much thought to the time of day beyond their vicinity.*

In 1830, the railroad era began with the inauguration of the Liverpool and Manchester Railway. Whereas traditional differences of

a few minutes had been inconsequential, now the slightest tardiness could mean abandoning or postponing a long-planned journey. Like the advent of the factory, the coming of the passenger train helped secure a place for punctuality in the modern system of Western values. The railroad was a means not just of transportation but of communication, a source of vital information about government and commerce. The communities it connected, long isolated and virtually independent, were being gradually integrated in a systematic whole. As people miles apart became more aware of one another, they also became aware of (3)*the inconvenience arising from the temporal distance that separated them.* Given that they used the same railroad timetable, (4)*wouldn't it make more sense if they shared a single standard of time?* In 1840, the Great Western Railway of England adopted Greenwich mean time in all its stations. At first its schedules were laden with footnotes converting the various local times into GMT. But soon other railways, and then cities, followed suit, and by 1855, 98 percent of Britain's public clocks were set to Greenwich time.

If multiple standards of time produced inconvenience in Britain, which spans only seven degrees of longitude, the problem was compounded in the United States, which, between easternmost Maine and westernmost Washington, encompasses no fewer than fifty-seven degrees. By the mid-nineteenth century, hundreds of time standards were in use. Wisconsin alone had thirty-eight time zones; Michigan and Illinois had twenty-seven each.

The idea that, ultimately, would greatly simplify things came from Charles F. Dowd, headmaster of a private school in Saratoga Springs, New York. Dowd proposed that the United States be divided into four "time belts," each fifteen degrees of longitude wide. The belts would be centered on the 75th, 90th, 105th, and 120th meridians west of Greenwich. Since fifteen degrees constitute one twenty-fourth of the earth's circumference, the temporal distance from one meridian to the next would be one hour. All clocks in the United States would be set either five, six, seven, or eight hours behind Greenwich time.

QUESTIONS

PART ONE

Translate the underlined parts (1), (2), (3), and (4) into Japanese.

PART TWO

1. In lines 3–4 it is said that "the telegraph and telephone had yet to be invented." Rewrite this clause in two ways, beginning as is indicated below:
   a) the telegraph and telephone had not
   b) no one
2. The word "Observatory" in line 10 comes from the verb "to observe." What was observed in this Observatory? Write your answer in a complete English sentence.
3. Give, in English, two examples of a "timepiece" as used in line 12.
4. Below you will find several definitions of the word "mean" as used in line 12. Write the *letter* of the definition which is most suitable here.
   a) to signify
   b) inferior in grade or quality
   c) stingy or miserly
   d) an agency, instrumentality or method used to attain an end
   e) something intermediate, that which is midway between two extremes
5. In lines 13–14 it is said that the post office served mainly "the affluent." With what *other words* in this passage are these words contrasted?
6. If it is three o'clock in the state of Maine, what time is it in the state of Washington? Give your answer in a complete English sentence.

PART THREE

In terms of the above discussion, is Japan more similar to England or to the United States? Answer in two or three complete English

sentences, giving reasons why you answer as you do.

I would like to concentrate my remarks on an analysis of the student answers to the last five questions in Part Two, Questions 2–6.

Question #2 asks the student "what was observed" in the Royal Observatory mentioned in line 10 of the text. (This question, like Question #6, asks for a complete English sentence in the answer; in the light of this instruction, in the actual grading, points were, of course, subtracted if the answer was *not* a complete English sentence. In my analysis, however, I would like to disregard the element of composition and consider only the content of the answers to these two questions.)

165 students answered this question. The answers given were:

CORRECT OR VAGUELY CORRECT (45) (27.3%):

the movement of the stars, moon, and sun (or close variation thereof) —19
the sun—6
stars—6
the planets—4
astronomy—4
star—3
heavenly bodies—1
planet—1
the sky—1

ANSWERS BASED ON "TIME" (105) (63.6%):

time—43
a regional time zone—7
the most reliable time—6
the standards of time, Greenwich mean time—5
the precursor of a regional time zone—4
the accurate time—3
the most reliable timekeeper in Britain—3
Greenwich mean time—3

a timepiece—2
a timepiece set to Greenwich mean time—2
a new standard of time—2
the temporal distance—2
the standard of time—1
the rightest time—1
average time—1
the multitude of local times—1
each mail-coach guard was required to carry a timepiece set to Greenwich mean time—1
each mail-coach guard carried a timepiece set to Greenwich mean time—1
the most reliable timekeeper—1
regional time—1
the time that was used in Britain—1
the time in all parts of Britain—1
the time's difference—1
various time zones to find regional time zone—1
the time of every country—1
the time of the watch which was belonged to the government—1
that the time in Britain kept good time—1
a timetable—1
if every mail coach carried a timepiece set to Greenwich mean time—1
there is a difference of the time of day between the regions—1
whether the correct time was keeped—1
to carry a timepiece—1
the problems posed by the multitude of local times—1
to carry a timepiece set to Greenwich mean time—1
keeping good time—1

OTHERS (15) (9.1%):
mail-coach service—4
the British mail-coach—3
mail-coach guard—2

the Royal Family—2
the behavior of the King—1
a company—1
the weather—1
trails—1

Forty-five students, or 27.3% of the total, gave answers which were more or less to the point—that at the Royal Observatory the heavens (the stars, the planets, the moon, the sun, the sky, heavenly bodies, etc.) were observed—that is, watched carefully and closely. However, of more interest is the fact that the most common single answer (43 students, or 26.1%—almost as many as gave some variant of the correct answer) was simply "time." If to this simple word we add such variants as "the time in Greenwich," "the accurate time," "the most reliable standard of time," "average time," and "the rightest time" (*sic*), we have a total of 105 students, or 63.6% of the total number, answering in some form that in the Royal Observatory "time" was observed.

The confusion seems to have arisen from an error, or elision, of logic in connection with the verb "observe." Since time is an abstract thing which cannot be seen, and so cannot be observed, it would, logically, seem unlikely to be an answer, not to mention the most common answer. Somehow, that is, these many students have blithely skipped over the objects actually "observed" and jumped to the purpose of observing them—that is, setting the time. But why make such a logical jump? Let us postulate the theory that the jump was made for no more exotic reason than that the students' first impulse was *to find in the passage itself* some word or words which would answer the question. Since the passage is concerned with the establishment of the concept of standard time, it was not difficult to pick up the basic idea of "time" and, willy-nilly, employ it as an answer here.

The validity of this theory is supported by the specific answers. No fewer than seven students (4.2%), for example, cited "a regional time zone"—four words taken from the line (9) before that in which

the phrase "Royal Observatory" occurs. (If we add the one student who wrote only "a regional time" in what seems to have been an aborted effort to write the complete phrase, the number of students answering thus would reach eight, or 4.8%) In addition, four students cited an even longer phrase: "the precursor of a regional time zone" from line 9. Therefore, a total of twelve students (7.3%) provided answers based on "a regional time zone." Three picked up "Greenwich mean time" from line 12, four picked up "the most reliable timekeeper in Britain" from lines 10–11, one chose "the multitude of local times" from line 8, one cited the even longer quotation of "the problems posed by the multitude of local times" from lines 7–8, one produced the remarkable quotation of "every mail-coach guard was required to carry a timepiece set to Greenwich mean time" from lines 11–12, and four came up with either "a timepiece" or "a timepiece set to Greenwich mean time" (line 12).

A majority of the students seem to have assumed that the answer was somewhere in the text waiting to be found, picked up bodily, and incorporated into the answer. They numbered many more, in fact, than those providing the correct answer or something vaguely approximating it. In the face of this lemming-like drive to find the answer readymade, one must applaud the enterprise of those students, otherwise lamentable, who guessed that at the Royal Observatory "the behavior of the King" or "the Royal Family" (one answer each) was observed, and also that one student who ventured—no doubt in desperation—and by analogy with the establishment atop Mt. Fuji—that "the weather" was the object of examination.

Question #3, like Question #2, was designed to gauge the examinees' thinking ability by asking for some simple information which was *not* in the text. This question, that is, called attention to the word "timepiece," used in the text, and asked for two examples of such a thing.

Since, in this question, two answers were called for, the total number of responses should have been double the total number of students. However, some students failed to answer; the number of responses,

thus, totalled 312.

The answers to this question were:

TIMEPIECES (111) (35.6%):

clock—55

watch—52

a long timepiece—1**

a short timepiece—1** ** cited together

handwatch—1***

tableclock—1*** *** cited together

SOME CLEAR REFERENCE TO TIME (90) (28.8%):

*time table—31

*minute—12

*hour—8

*local times—6

*regional times—4

second—4

*regional time zones—3

*time belts—3

1 o'clock—2

2 o'clock—2

3 o'clock—2

working time—2

accurate time—1

11: 30—1

5 o'clock—1

*Greenwich mean time—1

part time—1

sunrise—1

10: 15—1

*38 time zones—1

*timekeeper—1

time standards—1

12 o'clock—1

OTHERS (111) (35.6%):

*schedule—31
letter—12
*telegraph—12
telegram—8
newspaper—5
*telephone—5
*mail coach—3
*precursor—3
*railroad—3
*railways—3
*British mail-coach service—2
bus—2
envelope—2
*the railroad era—2
air—1
Alaska—1****
card—1
*cities—1
*commerce—1
*government—1
*multitude—1
*New York—1****

****Alaska and New York were cited together

*new standard—1
*observatory—1
package—1
*the post office—1
*problems—1
the shape of the moon—1
*standard—1
*train—1
*27 each—1
weekly book—1

Here, thank goodness, the most common answers were also the correct ones. A total of 55 students cited "clock" and 52 cited "watch." Though it was not always true that these two words came in a pair, they were usually given together. While these were indeed the most common answers, it should also be noted, however, that such answers, even when supplemented by the scattering of other responses which somehow, however, feebly, cited actual timepieces, accounted for only about 35% of the total number.

The remainder of the answers, accounting for about 65% of the total, seem, at first glance, to be a motley group indeed. However, careful examination will show some patterns.

First, some students confused—Lord knows how—"timepiece" and "means of transportation." Perhaps the talk of railroads caused them to think in such terms. Such a way of thinking would, at any rate, account for "mail coach" (3) "railways" (3), "railroad" (3), "British mail-coach service" (2), "bus" (2), "train" (1), and perhaps "air" (1). Such answers total 15, or 4.8% of the total.

Second, no doubt working from the verb "carry," some students thought in terms of goods which the trains might carry. "Timetable" and "schedule," the most common answers (31, or 9.9%, each), might both be carried. A guard, that is, might "carry" a timetable, and "schedule" might be taken to mean a printed schedule (or timetable), though that is not the meaning of the word as used in line 7. Other students came up with "letter" (12), "newspaper" (5), "envelope" (2), "card" (1), "package" (1), and "weekly book" (1). This type of answer accounts for a total of 22, or 7% of the total. The total of items which might possibly be carried amounts to something like 27%.

By far a larger category, though, consists simply of words found elsewhere in the passage and copied onto the examination paper. In the listing above, I have marked such items with a single asterisk before the item. One must, of course, allow for some element of chance; it is perfectly possible that a student thought independently of a word which also appeared in the passage (though this is an unlikely possi-

bility in the case of a word like "multitude"). Even so, such seemingly copied responses total 147, or 47.1% of the total.

If we add together the number of true timepiece answers (111) and the number of answers taken, more or less bodily from the text, we have a total of 258, or 82.7%.

In summary, then, when asked to name two "timepieces" such as those which mail-coach guards were "required to carry," 34.3% answered correctly; 1.3% others made a guess, however feeble; 28.9% racked their brains, or searched in the passage, for some word, any word, connected with "time," and (the categories overlap here) 47.1% just took something from the passage period.

Looked at another way, 34% answered correctly, and an additional 27% at least cited something carriable. This leaves 38% who gave answers which were not at all logically responding to the question asked. Much of the problem lies, of course, in a simple inability to understand the question asked—probably the word "timepiece." A substantial number of others, though, must have assumed that the question was asking for a response taken from somewhere else in the passage. This assumption must have been made even in the absence of any such instructions as are found in Question #5, which *does* ask for words taken from elsewhere. A large portion of the examinees, then, either did not read the question carefully or were unable to understand it after they *had* read it.

Therefore, in the case of Question #3 we find a situation very similar to that in the case of Question #2. In both cases, in answering the question many students seem to have given no thought to either the question or the answer, but seem, instead, to have searched the passage for some response, *even in the absence of any instruction asking them to do so.* This probably reflects their training in English thus far, training which has too often concentrated mindlessly on the printed page before their eyes, and too seldom asked them to use their minds or their imaginations. 47.1% of the students, that is, had nothing of their own to contribute in answering a question which does not seem unduly challenging.

Question #4 presents rather a different situation, for of those questions being considered here, only this one asked the examinees merely to make a choice from among five listed alternatives. Perhaps because the form of the question was such, all 168 examinees answered this question. The results, if nothing else, illustrate the truism in teaching that some students will choose almost any given answer:

A—52 students —30.9%
B—17 students —10.1%
C—10 students — 6 %
D—22 students —13.1%
E—67 students —39.9%

The order of the popularity of the answers was, then, as follows, with the correct answer, E, leading the list:

E—something intermediate, that which is midway between two extremes —39.9%
A—to signify —30.9%
D—an agency, instrumentality or method used to attain an end —13.1%
B—inferior in grade or quality —10.1%
C—stingy or miserly — 6 %

If virtually 40% of the students were correct, however, 60% of them were wrong. Why? Undoubtedly there was widespread failure to understand the words in the given definitions, but, if such were the case, one would have hoped for a rather more logical attempt to work out an answer.

The five choices are of three grammatical types—two nouns (E and D), two adjectives (B and C), and one verb (A). If the students had seriously considered the use of "mean" in line 11—"Greenwich mean time"—one would have thought that, judging from the position of "mean" in the phrase, the verbal definition, A, could safely have been eliminated. Far from such being the case, however, only 9 percent fewer chose the verb than chose the correct answer—it was

by far the most popular of the incorrect answers, accounting for more answers than the other three combined.

On the contrary, judging from the position of " mean " in the phrase " Greenwich mean time," one would think that, if the problem had been approached logically, without knowledge of the meanings of the key words in the definitions, the adjective use would be most likely. (Of course, in this case the adjective use was not the correct answer, but logically it would seem likely—just as likely as a noun use, and clearly more likely than a verbal use.) However, the two adjectival definitions, B and C, ranked as the least popular of the five.

At any rate, we seem to have here a situation in which 60% of the students failed to make any connection of the phrase with the concept of " Greenwich hyojunji," which they presumably *did* know. (Of course, it must be admitted that none of the alternatives provided corresponded to the idea of " standard " in the Japanese " hyojun," but, for better or for worse, the English phrase in question includes " mean," not " standard.") Then, in the light of their failure of understand the words of the possible definitions provided, necessarily forced to guess, they guessed more or less at random, with little attempt made to work out the logically more likely answer.

One wonders if the problem does not arise at least in part from the students' dependence on their dictionaries. Their constant compulsion to " look it up," while no doubt commendable in itself, and better than a refusal to look up any words at all, is yet so ingrained that they fail to take the step which should precede looking it up—making an intelligent guess as to the meaning. The Japanese language, with its use of radicals to form the Chinese characters, makes it eminently possible to deduce that such-and-such is, say, a fish even if one does not know what kind of fish it is or even how to begin to pronounce the character. One suspects, though, that too often English is taught word by word, with students too often enjoined to " look it up in the dictionary " first of all before making an intelligent guess from the elements of the word in question (admittedly useless here) or from its grammatical function in the sentence.

A seemingly extraneous anecdote may be illuminating here. For more years than I would care to count I have been a reader of the American magazine "Harper's," originally published by the publishing house founded by the Harper brothers. It has always been characteristic of this magazine that its name is the most prominent thing on the cover—at the top, centered, and printed in large type. It is, in short, one would have thought, obviously the name of the magazine. And yet very often over the years, as I have chanced to be carrying that magazine with me in Japan, students have glimpsed the cover and, in a sincere effort to learn and/or an effort to impress me with their diligence, have whipped out a dictionary to look up "Harper's"! They seem to do this, that is, with total disregard of the seemingly obvious fact that even if, by chance, the word *did* have a meaning in itself, that meaning would be of little importance in this instance. Even if a student of Japanese saw, for example, a copy of "Bungei Shunju," looked up the meaning, and came up with "writing-art-spring-autumn," he would be little the wiser if he did not realize the most important fact from the context—that it is the title of the magazine in front of his eyes.

With Question #5 we come to the one question in the examination in which the students were asked to find specific words in the passage. Here, that is, the students were invited to do what they seemed happiest to do—Search the Passage for the Mystery Words. Even here, however, the answers were not remarkably often correct.

The question asks which "other words in this passage" are used as a contrast to "the affluent" in line 14. The answer could be either "the populace" of line 13 or "most citizens" of line 14.

Since, in answering this question, the words *were* copied from the text, it has seen wisest, in tabulating the results, to follow the general principle (with some exceptions) of grouping separately even portions of a longer phrase, such as "the post office established the precursor of a regional time zone," when only those portions were provided as the answer. The 151 answers to this question were (with the correct answers marked with an asterisk at the left):

*the populace—27 (17.8%)
*most citizens—13 (8.6%)
a new standard—8 (5.3%)
their vicinity—7 (4.6%)
tardiness/slightest tardiness—6 (4%)
a timepiece—6 (4%)
*citizens—5 (3.3%)
the precursor of a regional time zone—5 (3.3%)
punctuality—5 (3.3%)
the telegraph—5 (3.3%)
communication—4
the post office established the precursor of a regional time zone—4
precursor—4
Greenwich mean time—3
government and commerce—3
time—3
a timepiece set—3
the multitude of local times—2
regional time/regional time zone—2
a source of vital information about government and commerce—2
transportation and communication—2
vital information—2
according to a schedule—1
the advent—1
between the big cities, for the rich man, for the person who could write letters—1
giving much thought to the time of day—1
the inauguration—1
the inconvenience—1
instantaneous—1
long isolated and virtually independent—1
a long-planned journey—1
mail—1
mean time—1

multiple standards of time—1
no instantaneous contact—1
the passenger—1
the poor and average citizens—1
reliable—1
the Royal—1
the Royal observatory—1
schedule—1
a single standard of time—1
the post office served mainly " the scarcity "—1
the telegraph and telephone—1
the time of day—1
traditional differences—1
the various—1
their lives—1
timekeeper—1
timepiece set to Greenwich mean time—1
transportation—1
were been integrated—1

In summary, of the 151 students electing to reply to this question, a total of 45—29.8%—had some acceptable version of the correct answer. Indeed, if we extend the range of the possible and include all answers which involve people, we increase the number by only four—and this motley group of four includes one each of the following answers:

between the big cities, for the rich man, for the person who could write letters
the passenger
the poor and average citizens
timekeeper

Of this group, the first is obviously erroneous because it is contrary to what the passage says; moreover, both it and the third answer must be rejected because they both consist of the student's own words and

thus were *not* taken from the passage. This leaves only the second—"the passenger"—and the fourth—"timekeeper," and neither is anywhere near the correct answer except as they are nearer by at least involving people of some kind.

And here, surely, is the crux of the problem. Asked to produce a contrast to "the affluent" in the sentence "In those days the post office served mainly the affluent," only 49 students out of a total of 151 seem even to have realized that "the affluent," whatever the exact meaning of the adjective, was at least describing a group of people.

The other 102 students, or 67.5% of the total, seem to have chosen words at random, sometimes even coming up with such odd fragments as "a timepiece set," evidently construing it as equivalent to a "lunch set," or the "Royal." And one poor soul, evidently determined to copy from line 25, miscopied "were being gradually integrated" as "were been integrated," thus succeeding in losing whatever modicum of sense the original phrase had had. The majority of the examinees, therefore, seem to have had no sense of logic, no sense of the language, to fall back on when presented with the phrase "the affluent." They failed even to make use of the obvious contrast to "mainly" provided on the same line by "most." They were, that is, unable to make intelligent guesses, not even as far as "other words" indicating people.

This brings us to Question #6—the answers to which are, in many ways, the most intriguing and, unhappily, the most revealing.

This question asks for a specific answer: "If it is three o'clock in the state of Maine, what time is it in the state of Washington?" This question was asked in an attempt to judge the student's ability to put together information from various places and then, finally, think a bit for herself. Answering it required, that is, a synthesis of three pieces of information:

1) the fact that Maine is on the extreme eastern edge of the continental United States, while Washington is on the extreme western edge. This information is provided in lines 37–38: "between

easternmost Maine and westernmost Washington."

2) the fact that there are four time zones in the continental United States. This information was provided twice—by line 45 and by the last sentence: "All clocks in the United States would be set either five, six, seven, or eight hours behind Greenwich time."

3) the fact—admittedly not in the text, but supposedly common knowledge—that the sun rises in the east and proceeds towards the west.

A normal citizen of the United States would be able to provide this information without having to stop to figure it out, but even a naive, untravelled Japanese girl should be able to work out, with a little careful reading and cogitation, that if it is three o'clock in Maine, in Washington, three time zones to the west, and hence three hours earlier, it is twelve.

The answers? A dismaying example of what I have mentioned above—the truism that, here literally, some student will choose any answer. Even hour of the twelve is listed at least once, plus various times which do not coincide with the hour. (In this case, for purposes of mathematical clarity, I shall list the answers first in order of time rather than in order of frequency.)

1—1
1:09—1
2—1
two three (2:03?)—2
2:55—1
3—3
3:06—1
3:15—1
3:38—1
3:50—1
3:56—1
3:57—16
4—4

5—2
6—55
6: 48—1
7—14
about 7—1
8—3
9—1
10—2
11—12
about 11—2
11: 12—1
12—40* *(More precisely, 39 said " 12," and one said " 0.")

Now let us list the items in order of frequency:
6—55 (32.7%)
12—40 (23.8%)
3: 57—16 (9.5%)
7—14 (8.3%)
11—12 (7.1%)
4—4
3—3
8—3
two three (2: 03?)—2
5—2
10—2
about 11—2
1—1
1: 09—1
2—1
2: 55—1
3: 06—1
3: 15—1
3: 38—1
3: 50—1

3: 56—1
6: 48—1
about 7—1
9—1
11: 12—1

Forty students, or 23.8%, had the correct answer, but that was not the most common answer. The most common answer was six o'clock; 55 students, or 32.7% of the total, had correct arithmetic but strange geography, thus placing Washington three time zones ahead of Maine rather than three time zones behind it. In parallel fashion, 7.7% of the examinees (13) missed the correct answer by one hour, while more (9.5%) of them (16) missed the " correct-answer-if-calculated the wrong way " by one hour.

One remarkable thing about this set of answers is that a substantial number of students seem to have misunderstood the very concept of time zones—that they proceed by units of one hour, with the result that if it is an even hour in one time zone, it will also be an even hour in another time zone. However, no fewer than thirty students, a rousing 17.9% of the total, do not even cite even hours as their answer! (This number included three who were so " Nihon-teki," or so cagey, that they produced only " about " a certain hour.) The most common of these " odd-minute " answers is 3: 57. When I first analyzed the results I thought that the students must have been subtracting *minutes* rather than *hours* in order to work out their answer—though even then I wondered why they should subtract the three minutes, for three time zones, from four o'clock rather than from the three o'clock given in the question. Perhaps some of the answers were indeed worked out in that fashion. Just as likely, though, is that the student latched onto the " fifty-seven degrees " of longitude which the United States is said (in lines 38–39) to encompass. Perhaps, then, the student simply added 57 (degrees) to the original 3 (o'clock) to produce " 3: 57," though this is obviously an example of adding oranges and horses.

When I discussed the results for Question #6 with several more

experienced Japanese speakers of English, the suggestion was made that there must be only a language problem here involved here—that if students had been asked the same question in Japanese, they would certainly be able to give the correct answer.

Therefore, I decided to have the relevant portion of the original passage (the fourth and fifth paragraphs) translated into Japanese, and then, of course, to ask Question #6—also in Japanese. These papers were, on October 4th, 1985, distributed to three classes of Freshman Oral English at Tokyo Joshi Daigaku. Both sets of students were, then, first-year students at the same university, in adjoining years. Admittedly, the second group of students was not completely comparable to the original group in that they were not especially talented in, or interested in, English—as evidenced by their all wishing to become English majors. However, since Japanese was the native language of them all, and since we were attempting to gauge simply the ability of the second group to calculate time in different time zones on the basis of a Japanese passage, these two sets of students seemed to form a valid basis for experimentation.

The answers were different, and a trifle more correct, but not remarkably so. Too, interestingly enough, the answers demonstrated not so much an increased proficiency as a new barrier to proper understanding. The answers given by this group of 109 students were as follows:

12—35 (32.1%)
6—30 (27.5%)
7—11 (10.1%)
11—9 (8.3%)
6: 48—9 (8.3%)
11: 12—8 (7.3%)
5—1
5: 48—1
6: 45—1
7: 20—1

10: 12—1
about 11—1
11: 18—1

(It is perhaps worth noting that the student who answered 6: 45 did her calculations on the question page, and those calculations actually led to an answer of 6: 48, though she wrote 6: 45 as her answer. If this was a simple clerical error on her part, and not an instance of second thought, the total number who wished to answer "6: 48" was 10, or 9.2%, putting that answer into a clear fourth place.)

Among these 109 answers, the most popular answer was the correct one of 12. However, the percentage answering correctly (32.1%) was not encouragingly higher than the original 23.8%. That is, in shifting from English to Japanese, the students' native language, the percentage of improvement was only 8.3%.

Notice, too, that the number of students choosing an uneven hour as their answer was 23, or 21.1%—3.2% more than before! Moreover, the exact nature of these uneven-hour answers underwent a sea change. On the original test, 3: 57, the answer seemingly arrived at by adding oranges and horses, was the most common such answer (chosen by 16 students—9.5%), but the second time no one answered thus. Instead, the answer of 6: 48 was the most common such answer (8.3%), although only one student had answered thus in the original test. Clearly some new, complicating factor was at work.

Luckily, a substantial number of students did their calculations on the question paper and so one could begin to trace their mental processes. It proved that this strange, unexpected answer of 6: 48 was arrived at in this manner: the text remarks that the United States encompasses fifty-seven degrees of longitude, and that Dowd proposed to divide it into four "time belts" of fifteen degrees each. One divides 57 by 15 to obtain the figure of 3.8. .8 of an hour is 48 minutes; therefore, 3.8 works out to three hours and forty-eight minutes. Add this figure to the 3 o'clock of the question and one reaches an answer of 6: 48. (In fact, as an extra bonus one can also thus account for the

second most popular uneven-hour answer, for three hours an). forty-eight minutes subtracted from three is 11: 12 (chosen by 7.3%. More, 5: 48 and 10: 12 seem to have been arrived at by a similar process.) This makes a grand total of 19 students (17.4%) who were—shall we say?—too sophisticated mathematically.

But why did 17.4% embark on this remarkable series of calculations the second time, when only two students (one having 6: 48 and one having 11: 12) seem to have done so the first time (for a total percentage of only 1.2%)? The clue probably lies in a mechanical change—in the original English text the numbers were most usually spelled out (certainly "fifty-seven" and "fifteen" were), while in the Japanese text all numbers were written in Arabic numerals, inadvertently making them easier for the eye to pick out.

At any rate, the second attempt to gauge student competence in this area did not produce any striking improvement. Even working within their own language, only 32.1% of college freshwomen are able to work out this problem calling for the application of simple logic and simple mathematics.

Undoubtedly the major reason for this astounding incompetence in logic, if not for the concomitant incompetence in mathematics, is that Japan itself has only one time zone, and so the students are not used to thinking in such terms. This explanation cannot, however, serve as an excuse. Students of nineteen or twenty should already have realized that the sun moves around the earth from east to west, carrying any given hour with it.

The basic problem with the answers to Question #6, as with the answers to many of the questions which this paper has examined, is a failure of the imagination. Students are so accustomed to finding the answer to any question *in the passage*, and so unused to contributing any real thought of their own, that both times Question #6 was asked, a great majority (76.2% the first time, "only" 67.9% the second time) failed to answer correctly. And yet, to return to the situation with which I began this paper, no doubt all these students would parrot the usual theme: "I know how to read, but I don't know how" to do

something else. How, though, can they *really* be said to know how to read, either?

I trust that the above data have clearly established a lack of imagination in the student interpretation of written texts. This investigation has not, however, been undertaken simply in order to point out errors in responding. Rather, the aim has been to find some hints as to teaching strategy. How, that is, can the teacher, either in junior high school, senior high school, or university, proceed so that students will read more deeply and better?

At the beginning, I must say that, of course, the teacher will never be able to teach any random group of students so well that they will answer perfectly questions about even a text which they have already studied—and here we are dealing with student responses to a text which they had, presumably, not seen before. (Nor, in truth, would the teacher *want* all the students to answer perfectly—in that case the examination would be useless as a measuring device.)

Even so, we need not throw up our hands in complete despair. Some suggestions are in order.

First, the student responses to Question #4 especially point to a weakness in vocabulary. It is hard to gauge what words students know and do not know, but it may be that in all the answers except E, which was correct and which was also the most commonly chosen, there was some unknown vocabulary item ("signify," "inferior," "stingy," "miserly," "agency," "instrumentality," "attain," etc.) which discouraged the students from choosing anything other than E, an item which, not entirely by chance, was perhaps the easiest to understand in itself. Perhaps it was this, in addition to the multiple-choice nature of the question, which caused this question to be answered correctly the most often of the five.

The strategy to overcome this weakness in vocabulary is not, however, to create yet another list of words for students to learn. Rather, words should be taught—and then practiced—in context, which is why it is always a good thing to ask students to do extensive reading in new material which is just a little difficult ("pleasantly difficult," as

it were) for them. Also, the ways in which English words are formed, with elements being borrowed from Latin roots, for example, should be a daily part of the teaching. Students should, that is, be trained to find, and remember, clusters of words rather than individual items. Then, on the basis of this remembered cluster plus the context, they should be led to guess the meaning. The teacher should not, that is, always insist that every new word be looked up in the dictionary. Instead, he should lead the student to remember other, similar, related words which he already knows, and perhaps the meaning will become somewhat clear at least. If "signify" causes trouble, remind them of "sign," if not of "significance."

Second, to return to a point which I have already touched on in passing several times, students must be trained to *add something of their own* to the text. Prospective teachers are urged often enough not always to ask for translations from English into Japanese. Similarly, not all the teacher's questions should be about the text itself. Rather, the students should be led to make deductions, if only simple, simple ones at the beginning. Many a time and oft I have asked students for the family name of, say, "Mrs. Smith's husband"—and received a reply that he doesn't know, and cannot possibly guess, because the printed page says nothing about her husband! Or the teacher should at least ask questions about the pictures which appear on every page of a junior high school textbook. "What season is it?" for example. After the first few weeks, students should be able to answer *that* in English. Later, as their vocabularies improve, they can be asked, and expected to say *something* in response to: "How do you know?"

The two suggestions are, in fact, two aspects of the same general approach. Students must be weaned away not only from their dictionaries, but also from the printed page. Instead, they should be encouraged to use their imaginations—and their heads. If a Japanese young lady of nineteen or twenty cannot imagine how time is counted on a continent like North America, she should be cajoled into *trying* to do so.